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MAMMALS UTILIZED AS FOOD BY OWLS IN REFERENCE TO THE LOCAL FAUNA OF NORTHEASTERN OHIO

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Abstract

Food habits of 6 species of owls living in northeastern Ohio were studied between 1949 and 1969 by pellet and stomach analyses. Small mammals constituted the bulk of the diet. In a sample of 1839 pellets of the Barn Owl from 5 counties, 96.86% of the food consisted of 3 species (*Microtus pennsylvanicus,* 77.27%; *Blarina brevicauda,* 16.94%; *Peromyscus leucopus,* 2.65%). Altogether, 14 species were utilized. These constituted 50% of the small mammal fauna of this area. Limited data indicate that the Great Horned Owl, Barred Owl, Long-eared Owl, and Screech Owl utilized essentially the same species, but the larger owls took more cottontails than the smaller owls. A sample of 85 pellets of the Short-eared Owl living at a city dump produced a different result, with 96.3% of the food consisting of introduced pest species—the Norway Rat (*Rattus norvegicus,* 75.9%) and the House Mouse (*Mus musculus,* 20.4%), with very little utilization of the common wild species of small mammals.

Introduction

Food habits of owls have been studied in northeastern Ohio over a period of 20 years by the analysis of disgorged pellets and stomach contents. For the 6 species of owls studied, small mammals constituted the bulk of the diet for each. While many studies have been published on pellet analyses for Barn Owls, this report gives stress to the relation of prey species to the available mammalian fauna.

Publications of food habits of owls in the area of the present study have been issued by Stupka (c. 1932) and Phillips (1951) for Ohio; by Price (1942)

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for northwestern Ohio and northeastern Indiana; by Kirkpatrick and Conway (1947) for Indiana; by Wilson (1938), Wallace (1948), and Reed (1959) for Michigan; and Pearson and Pearson (1947) for Pennsylvania. The Wallace report (1948) is the most complete for this area and contains an excellent bibliography on the Barn Owl, including food habits.

The most intensive study for this report was made on the Barn Owl (*Tyto alba*), formerly a common species, but now becoming rare in the area. Williams (1950) classified the Barn Owl as a "not uncommon permanent resident." Formerly, the writer and his students banded Barn Owl nestlings and collected pellets in many barns of northeastern Ohio. In recent years, however, no Barn Owls were reported to the *Cleveland Bird Calendar* from 1964 until 13 December 1967, when one was seen by B. P. Bole, Jr., at Kirtland Hills. During the annual Christmas Bird Counts reported in *Audubon Field Notes* and *American Birds,* only 2 records of Barn Owls are given for northeastern Ohio since 1964. The exceptions were single birds at Burton and Mentor in January 1976.

Results

A total of 1839 pellets collected from 5 counties of northeastern Ohio contained 5586 mammal skulls, which were identified through the keys of Katz (1941) and Glass (1958). This averages approximately 3 skulls per pellet, the same found by Wallace (1948) in his sample of 6742 pellets. Fourteen species of small mammals were included in the sample (Table 1). The two most common prey species, *M. pennsylvanicus,* the Common Field Mouse, and *B. brevicauda,* the Short-tailed Shrew, together account for 94.21% of the prey. The top 3 species account for nearly 97% of the food, while the remaining 11 species make up only slightly more than 3% of the food. The Meadow Mouse, *M. pennsylvanicus,* was the chief item of food for the Barn Owl in this area. This species comprised nearly 80% of Ohio pellets analyzed by Stupka (c. 1932) and a little over 85% reported by Phillips (1951). Both of these studies, however, found *B. brevicauda,* the Short-tailed Shrew, comprised a little more than 6%, in contrast to the present study, which found that it comprised nearly 17%. While Price (1942) found a similar utilization of the Meadow Mouse, he found the Short-tailed Shrew made up only 4% of the food in Williams County, Ohio, but he found *Cryptotis parva,* the Least Shrew, made up 27% as the second most important food item in that area. Wilson (1948) found *M. pennsylvanicus* and *B. brevicauda* to be the first and second most important in his study in Michigan, although the latter was less important than in the present study for northeastern Ohio. Wallace (1948) found a larger percentage for *M. pennsyl-*

TABLE 1

Mammals Found in Barn Owl Pellets—Northeastern Ohio—(1949–1969)

Species	*Lorain*	*Medina-Summit*	*County Portage*	*Stark*	*Totals*	*%*
Microtus pennsylvanicus	618	723	1672	1303	4316	77.27
Blarina brevicauda	92	133	512	209	946	16.94
Peromyscus leucopus	6	18	25	99	148	2.65
Zapus hudsonius	3	10	36		49	0.88
Rattus norvegicus	1	2	15	9	27	0.48
Sorex cinereus	3	3	15	6	27	0.48
Mus musculus	2	2	15	9	28	0.50
Condylura cristata		1	16	1	18	0.32
Cryptotis parva	3		4		7	0.13
Eptesicus fuscus	1		6		7	0.13
Sylvilagus floridanus			1	5	6	0.11
Parascalops breweri			3	1	4	0.04
Sorex fumeus		1		2	0.04	
Mustela nivalis		1			1	0.02
Totals	729	894	2320	1643	5586	
Number of Pellets	307	283	710	539	1839	

vanicus (84.97%), but a smaller percentage for *B. brevicauda* (6.53%), in his study in Michigan, than reported here, but these 2 species made up the bulk of the diet in Michigan as well as in Ohio.

Pellets and stomach contents of the Great Horned Owl (*Bubo virginianus*), Barred Owl (*Strix varia*), Long-eared Owl (*Asio otus*), and Screech Owl (*Otus asio*) indicate utilization of the same common species of mammals used by the Barn Owl. However, insufficient data were acquired to establish meaningful ratios of prey. The only notable difference is the more common occurrence of the Cottontail Rabbit in the diet of the larger species of owls.

A sample of 85 pellets of the Short-eared Owl (*Asio flammeus*) collected 8 February 1956 from an owl living at the Cleveland dump demonstrated an unusual relationship in the food of the owls. Synder and Hope (1938) found *M. pennsylvanicus* to make up the vast bulk of the diet of the Short-eared Owl. The House Mouse, *M. musculus,* represented only 0.1% of the prey in their study made in the Toronto region. Hendrickson and Swan (1938) found the winter food of this owl in Iowa to be almost entirely *M. pennsylvanicus* and *P. leucopus*. Terres and Jameson (1943) also found *M. pennsylvanicus* to make up the bulk (82.17%) of the diet for this owl near Perry City in New York, while *M. musculus* composed nearly 12%. Stegeman (1957) found *M. pennsylvanicus* to make up 97.2% of the winter food while *M. musculus* accounted for only 0.15% and *R. norvegicus* only 0.07% in central New York. Reed (1959) found only *M. pennsylvanicus* (74.1%) and *P. leucopus* (25.9%) in the sample he studied in Michigan. In this study there were 41 skulls (75.9%) of *R. norvegicus,* and 11 skulls (20.4%) of *M. musculus*. There were only 2 skulls of *M. pennsylvanicus*. This is a reversal of the usual ratio and is a reflection of the specialized habitat of this particular owl. While most owls live in rural habitats, this one lived in a city dump.

Discussion

Five orders of small mammals were utilized by the owls examined in this study. Rodentia (5 species) and Insectivora (6 species) composed over 99% of the food. Chiroptera, Lagomorpha, and Carnivora were each represented by a single species.

Phillips (1951) listed many local species of small mammals not utilized by the Barn Owl in his area. Bole and Moulthrop (1942) recorded 20 species of small mammals from northeastern Ohio. Only half of these were found in the diets of owls studied here. The other half, however, are either uncommon species for the most part, or they are chiefly diurnal in their activities. Dexter (1955) recorded 19 species of small mammals on the Kent State University

campus in Portage County, Ohio. Again, only half of these were found in owl pellets collected in that area, and those species not utilized are relatively uncommon and, in some cases, diurnal in their activities.

Pearson and Pearson (1947) concluded that, "Neither owls nor trappers catch a representative sample of the small mammal population." Stegeman (1957) also concluded that the prey found in pellets did not reflect the relative abundance of the prey species in nature, and Weller et al. (1963) demonstrated that "Mammal trapping in the owl roosting areas produced quite different data on species composition of the mammalian fauna than was implied from the remains in owl pellets."

Apparently, owl pellet analysis cannot be used to give reliable data on the relative abundance of local small mammals. It is clear from the present study, however, that the great bulk of mammals utilized by local owls for food consists of only 3 common species, with only 50% of local species in the area being utilized.

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